

he says, "RIGG has . . . pointed out the seemingly peculiar distribution of *Pseudotsuga taxifolia* as limited to the north-facing slopes of the hills." It is perhaps generalizing too much to say that the species under discussion is confined to the north-facing slopes "in *all* more or less arid regions," although the phenomenon is undoubtedly of frequent occurrence. If the reviewer interprets COWLES correctly, the absolutely rigid application of the principle quoted from his paper of 1901 is not in accord with the spirit of his more recent teaching. In regard to the quotation from the reviewer's paper, the facts are that the paper cited pointed out *four cases only* in these islands where the forest is largely limited to the north-facing slopes. It would be generalizing too much to say that this is true in all cases in the islands. The whole subject of forest distribution in the San Juan Islands should be made the subject of a careful field investigation. The point of view from which the paper is written is very suggestive and it forms a valuable contribution to the subject of forest distribution in the Northwest.—GEORGE B. RIGG.

Available soil moisture.—ALWAY²⁹ has grown plants in water tight cylinders until they die from lack of available moisture, and made careful determinations of the moisture conditions of the soils. He concludes that for comparing the available moisture in soils either the wilting coefficient or the hygroscopic coefficient may be used with equal efficiency. The former seems to him preferable in considering conditions of germination and growth of crop plants, and the latter in considering the seed production of such annual plants as field grains and the maintenance of life of perennial plants. Under the conditions of his experiments, most plants seemed capable of producing little or no growth after the soil moisture fell below the wilting coefficient, but whenever there was a well developed root system and no remarkably unfavorable conditions obtained, the plants were able to reduce the moisture content of the soil almost or quite to the hygroscopic coefficient, that is, to 68 per cent of the wilting coefficient. Little difference was found between the ability of the various crop plants used in the experiment to exhaust the soil moisture; while, on the contrary, marked differences were evident in their ability to remain alive after showing injury from drought. Desert legumes of perennial habit remained alive after the water content of the soil had fallen distinctly below the hygroscopic coefficient, showing that the water taken by the soil from a saturated atmosphere may be to some extent available for the maintenance of the life of such plants, although it is evidently beyond the reach of ordinary crop plants. Incidentally, evidence is presented that in many soils of dry lands, the loss of water from all but the thin upper stratum takes places entirely through transpiration.

The bulletin reports a good example of an investigation in a quantitative manner of problems in plant production important alike to agriculture and ecology.—GEO. D. FULLER.

²⁹ ALWAY, F. J., Studies on the relation of the non-available water of the soil to the hygroscopic coefficient. Agric. Exp. Sta. Neb. Research Bull. 3:133. figs. 37. 1913.